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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,122	08/23/2001	Gopal Laxman Tembe	029034/281611 (INPC-101)	1053
909	7590	06-09/2004	EXAMINER	
PILLSBURY WINTHROP, LLP			DANG, THUAN D	
P.O. BOX 10500			ART UNIT	PAPER NUMBER
MCLEAN, VA 22102			1764	

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

CD

<b>Office Action Summary</b>	<b>Application No.</b> 09/938,122	<b>Applicant(s)</b> TEMBE ET AL.	
	<b>Examiner</b> Thuan D. Dang	<b>Art Unit</b> 1764	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12,14-29,31 and 32 is/are pending in the application.
- 4a) Of the above claim(s) 1-12,14-29,31 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12,14-29,31 and 32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 31 and 32 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not support the limitation of claim 31 and 32 (see the entire specification for details), namely “a mixture of alkyl aluminum halide and a zirconium(IV) alkoxide.alcohol preparation”. This compound is totally not supported from the specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 31-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear What “aliphaticor” on line 4 of claim 31 is.

Regarding claim 31 and 32, the term “a zirconium(IV) alkoxide.alcohol preparation” cannot be understood. Is it a compound, a process, or something else?

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 14-17, 18, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langer, Jr. (4,409,414).

Langer discloses a batch/continuous process of making alpha-linear olefins having applicants' claimed range of number of carbons by oligomerizing ethylene in the presence of a

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catalyst containing zirconium alkoxide such as  $\text{Zr}(\text{OBU})_4$  and alkyl aluminum halide, in the presence of a diluent such as toluene under the condition of a temperature ranging from below  $125^\circ\text{C}$ , a pressure ranging from above 50 psia such as 500 psia, during the applicants' claimed time and high-speed stirring (the abstract; col. 2, line 18 thru col. 6, line 34; col. 7, lines 12-29; examples, and the entire reference for details).

Langer discloses that the process is operated in the presence of alcohol to enhance the polymerization process (col. 5, lines 55-68).

On column 6, lines 1-4, Langer disclose ratio of the amount alcohol and the alkyl group of aluminum alkyl. Since the examiner cannot compare this ratio with the applicant's claimed ratio as called for in claim 1. The examiner **assumes** that the ratio used by applicants is different from the Langer's one. However, as disclosed by Langer, the amount of alcohol effect to the molecular weight of the product (col. 5, lines 55-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Langer process by selecting an appropriate amount of the added alcohol such as the applicants' claimed one according to the desired molecular weight of the product since it has been held by the patent law that the selection of reaction parameters such as temperature and concentration would have been obvious. More particularly, where the general conditions of the claimed are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955). *In re Waite* 77 USPQ 586 (CCPA 1948). *In re Scherl* 70 USPQ 204 (CCPA 1946). *In re Irmischer* 66 USPQ 314 (CCPA 1945). *In re Norman* 66 USPQ 308 (CCPA 1945). *In re Swenson*

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56 USPQ 372 (CCPA 1942). *In re Sola* 25 USPQ 433 (CCPA 1935). *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

New claims recite steps of making the catalyst used for the process by adding components. However, it has been held that a proper sequence of adding ingredients to obtain the most satisfactory mixture is within the expected skill and judgment of a mechanic. *In re Gibson* 5 USPQ 231, 232 (CCPA 1930).

Langer does not disclose the speed of agitator in the stirred tank. However, Langer discloses operating the reaction by a high-speed stirring (example 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select an appropriate stirring speed such as 300-1000 rpm to well-mix the reaction as taught by Langer to arrive at the applicants' claimed process.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Langer, Jr. (4,409,414) in view of Shiraki et al (5,260,500).

Langer discloses a process as discussed above.

Langer does not disclose adding thiophene into the catalyst (see the whole patent to Langer for details). However, Shiraki discloses that in a process for producing a linear alpha olefins, it is effective to add to the catalyst a sulfur compound such as thiophene to improve the purity of the linear alpha olefins (col. 1, lines 19-28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Langer process by adding an amount of thiophene to increase the purity of the product.

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Claims 4-12, 20-22, 24-27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langer, Jr. (4,409,414) in view of Young et al (4,855,525).

Langer discloses a process as discussed above.

Langer does not disclose using aluminum compounds as called for in claims 4-12, 20, 21, 25, and 26. However, Young et al discloses that aluminum compounds such as  $R_3Al_2X_3$ ,  $AlR_2X$ ,  $AlR_3$ , and  $AlRX_2$  are equivalent components for oligomerization catalysts with X being Cl, R being ethyl (the abstract; col. 4, lines 46-51).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Langer process by using  $R_3Al_2X_3$  and  $AlR_3$  as the aluminum component for the Langer catalyst since it is expected that using any equivalent aluminum compounds disclosed by Young would yield similar results.

Claims 23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langer, Jr. (4,409,414) in view of Young et al (4,855,525) further in view of Shiraki et al (5,260,500).

Langer and Young disclose a process as discussed above.

Neither Langer nor Young disclose adding thiophene into the catalyst (see the whole patent to Langer for details). However, Shiraki discloses that in a process for producing a linear alpha olefins, it is effective to add to the catalyst a sulfur compound such as thiophene to improve the purity of the linear alpha olefins (col. 1, lines 19-28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Langer process having been modified by Young's aluminum compounds by adding an amount of thiophene to increase the purity of the product.

*Response to Arguments*

Applicant's arguments filed 4/2/04 have been fully considered but they are not persuasive.

The argument that the cited disclosures are directed to mostly very short C4 to C8 oligomers and are silent as to producing any major size portion of linear C10 to C20 at high yield is not persuasive since this is opposite to what applicants claim "C4 to 24 carbons".

The argument that the catalyst used in the present examples is in the form of  $\text{Zr}(\text{Obu})_4(\text{BuOH})$  is not persuasive since the claimed process is not the process in the examples. In other words, applicants do not using a catalyst in the form of  $\text{Zr}(\text{Obu})_4(\text{BuOH})$ .

The argument that the catalysts of the invention have a definite stoichiometry and cannot be generated even by a combination of "in situ" methods described by Langer/Young/Shiraki is not a statement made by applicants without a supporting proof. In other words, applicants do not demonstrate that the catalyst of the prior art cannot be the catalyst of the claimed process.

The argument that newly added claims 31 and 32 has a full support throughout the specification, especially on pages 3-5 as well as the examples and tables of the experimental results is incorrect (see the above 112, 1<sup>st</sup> rejection).

The argument that Langer, Jr. does not employ  $\text{AlEt}_2\text{Cl}$  and/or  $\text{AlEtCl}_2$  is not persuasive since these are disclosed by Young.

The argument that there is no motivation to combine Young with Langer, Jr. is not persuasive since as discussed in the above rejection, Young et al discloses that aluminum compounds such as  $\text{R}_3\text{Al}_2\text{X}_3$ ,  $\text{AlR}_2\text{X}$ ,  $\text{AlR}_3$ , and  $\text{AlRX}_2$  are equivalent components for oligomerization catalysts with X being Cl, R being ethyl (the abstract; col. 4, lines 46-51). It



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would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Langer process by using  $R_3Al_2X_3$  and  $AlR_3$  as the aluminum component for the Langer catalyst since it is expected that using any equivalent aluminum compounds disclosed by Young would yield similar results.

The argument that Shiraki teaches away from the use of thiophene as an additive – replacing with alcohol is not persuasive since Shiraki disclose using this sulfur compound to improve the purity of the product (col. 1, lines 29-35).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan D. Dang whose telephone number is 571-272-1445. The examiner can normally be reached on Mon-Thu.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thuan D. Dang  
Primary Examiner  
Art Unit 1764

09938122.20040608  
June 8, 2004

A handwritten signature in black ink, appearing to read 'Thuan D. Dang', is written over the printed name and title.